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ABSTRACT

The monograph examines the relationship of nuclear power to world order. The major purpose of the document is to stimulate research, education, dialogue, and political action for a just and peaceful world order. The document is presented in five chapters. Chapter I stresses the need for a system of global security to counteract dangers brought about by increasing access to nuclear technology. Security measures include safeguards such as non-proliferation agreements, nuclear test bans, and control of terrorist activity. Chapter II discusses factors which set nuclear superpowers apart from other nations. Major factors are military advantages (including first-use options) and commercial benefits. Chapter III outlines steps toward military denuclearization, which is interpreted as the process of progressively eliminating nuclear weapons. Chapter IV supports commercial denuclearization as a means of prohibiting dissemination of techniques and materials which can be easily converted to military use. The final chapter stresses the need to reorient global security and energy policies in non-nuclear directions. (DB)

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Nuclear Policy And World Order: Why Denuclearization

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This paper is one in a series of working papers commissioned by the World Order Models Project in its effort to stimulate research, education, dialogue, and political action which will contribute to a movement for a just world order. The papers will deal with major global problems facing humanity, and particularly vexing contemporary political, economic, social, and cultural issues within an analytic and normative framework guided by the concepts and values of peace, economic well-being, social justice, and ecological stability. Special emphasis will be given to the necessity and feasibility of structural transformation of today's fragmented world in order to resolve these problems and achieve just world order results.

A Working Group of the World Order Models Project (WOMP) will use these papers in its new program aimed at publishing a statement in 1980 outlining the strategies for realizing just world order during this century. We invite interested individuals throughout the globe to respond to the various papers either directly to the individual authors or to WOMP. These communications will figure significantly in the WOMP Working Group's final statement. Where appropriate, the responses and critiques will be published in *Alternatives: A Journal of World Policy*.

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NUCLEAR POLICY AND WORLD ORDER: WHY DENUCLEARIZATION*

Richard FALK†

While taking note of the growing anxiety, particularly on the part of the superpowers, over the spread of nuclear technology and of the frantic campaign (most of all on the part of the USA), through a combination of pressures and blandishments, to halt proliferation, the paper does not see much chance of the campaign succeeding so long as as it remains suspect because, among other reasons, of its being spearheaded by a power which is itself the greatest proliferator and one, too, which has not only got an enormous stockpile of nuclear weapons, but is constantly engaged in evolving ever more sophisticated (which means deadly) weapons. Nonproliferation, unless wedded to denuclearization, will continue to be viewed by non-nuclear states as unacceptably discriminatory and as a geopolitical confidence trick calculated to freeze the present hegemonistic global structure. Obviously, the first moves toward denuclearization have to be made by nuclear nations, but, above all, by the two superpowers. However, denuclearization will be illusory if a distinction is made between the military and the civilian uses of the atom. Denuclearization must, therefore, at some stage – now rather than later, when it might be too late – involve the total renunciation of nuclear power for whatever purpose and its substitution with other less centralized, less costly, and pollution-free sources of energy, such as sun, wind, water and biomass. In between, however, the ruling elites all the world over, but principally in

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*An earlier, much shorter, version of this paper was published in *International Security* I, 79–93 (1977). My efforts to evolve a world order approach to these issues of nuclear policy have been deeply influenced by discussions over a period of several years with WOMP colleagues. At international meetings of WOMP I at Holderness, New Hampshire, in 1976 and, then, at Colgate, New York, a year later, drafts were criticized in detail. Although many individuals have made useful comments, I would like especially to thank Fouad Ajami, Graciela Chichilnisky, and Ali Mazrui for their valiant efforts to prevent me from succumbing to First World provincialism. On no issue of global concern is this failure to acknowledge the biased filter of time and place more prevalent and more pernicious, I believe, than with respect to nuclear weapons policy. Such a comment applies with particular force to Americans who lead the world both with respect to reliance on nuclear weaponry and with regard to sermonizing others on the evils of such reliance. Of course, I have not escaped my identity as an American in assessing these issues or in my understanding of what is most 'irrational' and 'dangerous' about them. Quite consciously, however, I have tried to be guided by self-interest, allowing the 'self' to include my human identity as a planetary citizen as well as my narrower identities as a North American, as a white male, as a father of young children and so forth. In my view, learning to feel, think, and act like a planetary citizen is what world order studies are all about.

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its industrialized part, have to accept a concept of world order securely anchored to the values of peace, economic well-being of all, social and political justice, both within and between nations, and environmental quality. Recognising that such a world order cannot be erected at one go, the author suggests transition steps, none frighteningly radical in itself and each demonstrably feasible, although establishment circles, unable to move out of the narrow groove of conventional wisdom, may scoff at them as 'romantic' or 'utopian'.

I. The relevance of world order

The quality of 'world order' lies in the eye of the beholder. In discussions of nuclear policy within the United States, world-order considerations are typically invoked to underscore the wisdom of confining the spread of nuclear weapons to the narrowest possible extent[1]. Underlying these nonproliferation goals, which combine traditional US foreign policy concerns with a broader commitment to the avoidance of nuclear war, is the conviction that the fewer nuclear actors the better. Increasingly, this arithmetic image of proliferation is reinforced by explicit anxieties that nuclear weapons will come into the hands of 'irresponsible governments, namely Third World rulers, as well as nongovernmental and especially terrorist groups (George Ball, 1976). Both these fears and the 'world order concerns' they provoke have intensified recently, because nuclear technology now appears within easy reach of virtually all governments and nongovernmental actors as well. One reliable source estimates that by 1985 as many as 50 countries could 'produce enough plutonium each year for at least several dozen nuclear explosives'[2]. An even more immediate danger, say other analysts, is that 'economic competition among nuclear suppliers today could soon lead to a world in which twenty or more nations are but a few months away from a nuclear weapons force' (Baker, 1976; Schelling, 1976).

Three developments have created this disturbing situation:

—the rush of many governments around the world to develop nuclear power facilities as a consequence of rising oil prices, the unreliability of existing supplies, and the realization that all natural stocks of petroleum will eventually dwindle in any event;

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[1]For example, Lincoln P. Bloomfield (1975); George H. Quester (1975); Alton Frye (1976); Michael Nacht (1975). The most comprehensive inquiry along these lines is by William Epstein (1976). See also Daniel Yergin (1977a).

[2]'Approaches to Arms Control and Disarmament', 24th Report of the Commission to Study the Organization of Peace, July 1976, p. 31. President Ford's report to Congress on the subject estimates that 40 countries will have a weapons-producing potential by 1985.

—the actuality of India's nuclear explosion in May 1974, which demonstrated that states with civilian nuclear programs can simultaneously but surreptitiously develop their own nuclear-weapons capability;

—the intensifying competition among supplier nations for foreign nuclear sales, which has highlighted the incompatibility between nonproliferation goals and the pursuit of national commercial advantage. Essentially, this reality has emerged from a break in the US monopoly over civilian nuclear technology, and the willingness of France and Germany to provide desirous buyers with *all* elements of the nuclear fuel cycle, including enrichment and reprocessing facilities. In terms of global political impact, the commercial equivalent of India's explosion has been the German–Brazilian deal worth at least $8 billion (Gall, 1976).

Such increasingly broad access to nuclear technology raises the alarming prospect that beleaguered governments or desperate political actors of any sort may acquire, and possibly even use, nuclear weapons for their own political purposes. This potential has already been demonstrated by Israel's semi-overt reliance on a secret nuclear arsenal which apparently numbered thirteen weapons at the time of the 1973 October war. These nuclear weapons were reportedly assembled after Israeli leaders had been informed by their military commander on the Suez front that Egyptian forces might soon break through Israeli defense lines[3]. South Africa, South Korea, and Taiwan are also beleaguered states whose ruling groups face adverse regional and/or domestic balances of power, and who are obviously strongly tempted to acquire their own nuclear weapons capability–not only for its value as a deterrent but also as a military option of ultimate resort. These countries provide plausible settings for future military conflict in which the 'losing' side (in conventional terms) may be tempted to rely, however self-destructively, on nuclear weapons.

Another category of nuclear aspirants consists of states which seek a new and stronger lever in international relations, often in the context of shifting regional balances. India initiated its nuclear program partly to offset the effects of China's nuclear status. Pakistan may, in turn, be motivated to counter India's nuclear advantage–thereby leading Iran, perhaps, to invoke that development as justification for setting off a nuclear explosition of its own. The Shah of Iran has even been quoted as saying that 'If every upstart in the region acquires atomic bombs, then Iran must have them as well[4].'

Iran, Brazil, and possibly Indonesia and Saudi Arabia are all examples of states whose incentive to acquire nuclear status is linked to foreign policy

[3]This military eventuality never came to pass and, hence, nuclear weapons played no explicit role in Israeli diplomacy. For an account, see 'Special Report: How Israel Got the Bomb', *Time*, April 12, 1976, p. 39. For some background see Kohn and Newman (1977).
[4]Quoted by Yergin (1977a).

goals of achieving regional or subregional hegemony. With the decline of the American imperial presence, such opportunities for regional dominance now exist, waiting only to be seized by nations willing to invest in the necessary weapons capabilities. Of course, such developments might well lead to nuclear arms races on regional levels; if Brazil were to develop nuclear weapons, would Argentina be far behind? As the technological and economic inhibitions continue to fall, additional states will very likely come to associate their own prestige and autonomy with the development of national nuclear capabilities.

Disturbing though all these possibilities may be, there is no doubt that the current nuclear states are most alarmed of all by knowing that now even 'irrational' Third World leaders can secure nuclear weapons of their own. John Phillips, a Princeton undergraduate with no special training, has demonstrated that a crude atomic bomb can be made for as little as $2000 and with the appropriate *unclassified* information. Other evidence indicates that with sufficient money and will power, it is no more difficult to obtain enriched uranium or plutonium than it is to buy bulk quantities of heroin.

In this context, Libya's Col. Muhammed el-Qaddafi is usually presented as the extreme or worst-case example. First, there is the fear that Qaddafi is personally 'maniacal' enough to pursue his dreams of advancing Islamic unity and Libyan national goals by actually using nuclear weapons if once obtained. Moreover, Libya's emergence as a nuclear power would undoubtedly cause a regional chain reaction extending at least as far as Egypt and Israel. It would also definitively end all doubts about the ease with which *any* actor, whether governmental or not, could join the nuclear club if so determined[5]. Consequently, when the Libyan leader tried to purchase atomic weapons from France and China, it caused an international tremor, as did his apparent subsequent effort to assemble enough scientists and engineers to put together a few bombs.

Whether these particular fears are justified or not, it seems self-evident by any standards that the problem of nuclear proliferation presents ample grounds for concern, even alarm. Although the risks of nuclear war cannot be associated in any mechanical fashion with the number of nuclear actors, it does nevertheless seem logical to make some rough correlations between the extent of proliferation and the likelihood of nuclear war[6]. Conventional world-order thinking in the United States (and elsewhere in the Trilateral

[5]This prospect is well substantiated by Wohlsletter (1976–1977).

[6]At the same time, linear rationality is probably not very instructive in assessing risks, costs, and effects of varying nuclear policies. For all we know, a spirit of proliferation, perhaps accompanied by relatively small-scale threats or accidents or uses would trigger a nuclear disarmament movement of such force as to create for the first time in the nuclear age a genuine prospect of drastic global reform.

world) has therefore moved virtually automatically from the dangers of proliferation to a desperate search for new ways to halt proliferation. Recently, there has been a surge of writing on 'safeguards', and on incentives (such as better technology sharing or security guarantees from the nuclear powers) to make non-nuclear states forego their tentative nuclear aspirations[7].

Other suggestions focus on improving the Non-Proliferation Treaty by extending safeguards coverage to all elements of the nuclear fuel cycle (not merely reactors), and by giving the administering agency, the International Atomic Energy Agency, enforcement functions in addition to its present detection role[8]. One popular line of nonproliferation thought, encouraged slightly by the London Conference of Nuclear Supplier Countries held in 1975 and inspired by the tantalizing image of a 'nuclear OPEC' (Baker, 1976), is for nuclear suppliers to cooperate more closely among themselves. Still another popular proposal involves creating a multinational regional nuclear fuel center (as if a permanently reliable site existed), designed to give non-nuclear countries assured access to nuclear fuel without the need for them to establish enrichment and reprocessing facilities on their own soil. Currently, international controversy centers on the dispute between the United States and its European competitors, France and West Germany, over whether or not it is reasonable to sell the most proliferation-prone components of the nuclear fuel cycle (enrichment and reprocessing facilities). Indeed, in 1976 the United States induced South Korea to cancel its purchase of enrichment facilities from a French concern. In other settings, notably Iran and Pakistan, the United States has applied similar leverage in its role as a major supplier of conventional arms. In fact some analysts believe the United States would be more reluctant to sell ultrasophisticated weapons to the Shah of Iran, or offensive weapons like 100 A-7 Corsair fighter-bombers to Pakistan, if it did not attach such priority to the goals of slowing, as well as halting, nuclear proliferation.

A cynical interpretation of America's stress on nonproliferation emphasizes the present competitive edge which France and Germany enjoy in the more advanced phases of nuclear technology. In this view, the United States wants time for its own technology to catch up, in order to compete more successfully when the export market expands from reactors to complete fuel cycles.

Occasionally, America's priority on nonproliferation is translated into actions which even limit the discretion of existing nuclear powers. Attempts to limit the parameters of the arms race through the SALT (Strategic Arms

[7] For a useful summary, see Greenwood (1977).
[8] Well summarized by Yergin (1977a), p. 63

Limitation Talks) process, for example, are often described as an earnest of good faith by the superpowers. At least as of now, however, this interpretation is inaccurate; SALT has rechanneled arms competition rather than deescalated the arms race, and has not yet initiated moves toward nuclear disarmament. Unilateral arms restraints like President Carter's decision not to develop the B–1 bomber at this stage are also invoked as evidence of good faith on the part of the United States. Here too, however, such optimistic assessments are off the mark. In reality, steps which supposedly aid deescalation are in fact accompanied by compensatory forms of escalation, and are primarily motivated in any event by considerations of cost–effectiveness rather than arms control. In this case, for example, more strategic value could be obtained with the cheaper Cruise Missile than with the more expensive B–1 bomber.

In the available literature, some importance is attached to a comprehensive test ban which would preclude further nuclear explosions by all states[9]. Also mentioned frequently is the possibility that nuclear powers might pledge never to threaten to use or to use nuclear weapons against a non–nuclear weapons state that has ratified the Nuclear Proliferation Treaty (Nacht, 1975). In fact, however, at the NPT Review Conference in May 1975 the nuclear powers seemed unwilling to take even these modest steps in diminishing the *discriminatory* character of the NPT system. At most, then, the nuclear powers have merely sought new ways of moderating, and disguising, the discrimination within the international system against non–nuclear weapons states. Mainstream policy analysis rarely acknowledges the dubious validity of a world–order system based on the inherent discrimination which flows automatically from the distinction between nuclear and non–nuclear states[10].

Much of world public opinion seems justifiably suspicious of the way in

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[9]The United States and the Soviet Union signed a treaty in 1974 prohibiting test explosions in excess of 150 kilotons (or 10 times the magnitude of the Hiroshima bombs). The treaty has not been ratified, but its provisions established such a high threshold that current test programs could be continued without interference. The rationale for a high threshold is to assume that test explosions can be detected and identified in order to permit peaceful nuclear explosions (so–called PNE's) for building dams and canals, or for redirecting rivers. What the treaty does prohibit is any large–scale test explosion of the sort which would be set off by a new nuclear state lacking the more refined technology needed for testing large weapons through smaller explosions. This example is typical of arms–control measures with purported bilateral restraints whose inhibiting effect would be felt mainly by others. More recently, in October 1977, there were indications of Soviet–American receptivity to the idea of a total prohibition of nuclear explosions, at least for a trial period of three years. Such a step would seem to close off at least one dimension of the strategic arms race. Further evaluation, however, is required to determine whether recent technical achievements have simply obviated the need for testing.

[10]One exception in the serious literature is the 'Approaches' Report of Commission to Study the Organization of Peace, which connects nonproliferation goals with a revived concern for overall disarmament, including general and complete disarmament (GCD).

which the West, especially the United States, harps on the nuclear danger. Why are other comparable dangers given so little attention? For instance, deadly biological weapons of mass destruction are easy and cheap to produce, and their possession, moreover, is difficult to detect. Why has this danger not alarmed those who stress the risks of possible nuclear proliferation? Indeed, as terrorist activity suggests, all modern societies are vulnerable to determined opponents – who need only poison the water supply or destroy key bridges and tunnels.

What makes the nuclear danger so special, it would seem, is the fact that some governments insist on retaining the right to have, develop and use nuclear weapons, while at the same time seeking ways to prevent most others from doing the same. In effect, it is the frequent use of nuclear weapons – as actual instruments of war during World War II, and as political or psychological tools ever since – which endows these weapons with a certain legitimacy that biological weapons and deadly poisons do not share. Paradoxically, then, it is the relative *legitimacy* of these weapons which makes their possession by others seem so alarming – especially by those who seem to have the smallest stake in helping the present system to survive.

Second, the existing system of global security depends on letting each of the superpowers rely on their respective nuclear capabilities in their own spheres of influence. If the overall system is to work, these roles for nuclear weapons must be preserved in particular arenas, for instance, South Korea and Europe. The US reliance on nuclear weapons as a geopolitical instrument is clearer than the Soviet reliance. Nevertheless, the Soviet relationship with China has been very much shaped by the way in which the Kremlin has used its nuclear advantage. Significant forms of proliferation will interfere with existing international arrangements, although, as Chinese acquisition of a nuclear capability suggests, the shift from an absolute nuclear advantage to a relative one may not be as significant as the antiproliferation forces fear.

One of the more suspect elements in the nonproliferation sensibility is its preoccupation with what might happen if 'irrational' Third World leaders obtained nuclear weapons. One would think that Hitler and Mussolini – or, for that matter, Stalin and Nixon – were prehistoric figures. On the contrary, modern history shows that desperate leaders are likely to emerge in all societies which experience severe pressures. There is no evidence that Third World countries are especially to be feared in this regard. Beyond this, irrationality is often associated with unfamiliar cultural forms. When an African leader joins in a native dance, his behavior strikes us as 'wild'. When an American President calls a football coach in the middle of the night, as Richard Nixon once did, or insists on briefing his advisers from or even in the toilet, as Lyndon Johnson did, their actions seem to express harmless enthusiasm. The desperation of leaders in powerful states – even, or perhaps

especially, when reinforced by platoons of strategic thinkers bearing reams of computer printouts – is far more menacing to human destiny and nuclear peace, in my opinion, than is the alleged 'irrationality' of Third World leaders. It is chastening to recall that the first use of nuclear weapons, at Hiroshima and Nagasaki, was vindicated by 'rational' arguments about saving lives. Who could not devise similar arguments again, as long as no one questioned whether the underlying goals themselves were legitimate? Eminently 'rational' advisers were waiting in the wings throughout the Vietnam war, ready to make a moral case for using nuclear weapons against Hanoi.

Finally, if one considers the potential *global* side effects of a nuclear war between the superpowers, then the prospect that modest nuclear capabilities may proliferate within the Third World for purposes of regional security becomes a matter of distinctly secondary concern. Even if we project Third World scenarios where nuclear weapons are used, horrifying as such eventualities would certainly be, their orbit of effect would be geographically circumscribed, and local recovery prospects at least relatively favorable. In East–West relations, on the other hand, nuclear conflict could disperse lethal fallout throughout the planet, permanently wrecking the world economy and creating chaos and panic everywhere. When seen in this light, state visits by American leaders who counsel nuclear forbearance to their Third World counterparts appear as pious mischief, or worse[11]. The emphasis on nonproliferation, as distinct from denuclearization, is a geopolitical confidence game being played for stupendous stakes. Therefore, it should not be particularly surprising to find the United States – by far the greatest proliferator of nuclear weapons: its own – as the most passionate advocate of nonproliferation. What is surprising is that this dual reality has not been more widely noticed and challenged.

In view of the genuine danger of nuclear war and the growing salience of nuclear weapons in all modes of international relations, a far-reaching global policy on nuclear weapons is long overdue. This paper attempts to develop such a policy within the wider framework of world-order analysis and, in particular, with reference to four specific values which I believe would characterize a just world order: peace, economic well-being, social and political justice, and environmental quality[12].

[11]See, for instance, accounts of Secretary of State Cyrus Vance's visits to Argentina and Brazil in November 1977, exacting pledges from the leaders of these countries to restrict their nuclear programs (e.g. *N. Y. Times*, November 22, 1977, p. 3, November 23, 1977, p. A9). More plausible diplomacy would enact the process of persuasion more or less in reverse. When the giant insists that the midget remain unarmed for the safety of all, we are inhabiting a 'surrealistic' security zone.

[12]For a discussion and exposition of these world-order values, see Saul H. Mendlovitz, 'General Introduction' and Chapter 1 of Richard A. Falk (1975).

More concretely, the goal of this analysis is to suggest a global nuclear policy which would allow these world-order values to be realized, at least in some minimal way, by all the peoples of the world within the next few decades. In addition to being informed by specific values and adopting a long-range outlook, this perspective also assumes the necessity of *structural change*. By this, I mean a coherent series of fundamental reforms in the institutional arrangements and patterns of authority which currently characterize international relations. Such a thoroughgoing change is required, I believe, because, although the sovereign state and the state system itself remain beneficial for certain parts of the world and for particular normative purposes (for instance, to achieve equality among peoples, deepen the independence of Third World nations, and eliminate imperialism), these arrangements are not able to realize world-order values for the planet as a whole.

As the studies stimulated by the World Order Models Project suggest, interpretations and policy prescriptions can differ widely within a common framework of world-order values[13]. The distinguishing feature of world-order analysis from this perspective is that it views nuclear policy as one aspect of a wider search for stability and equity in the world. Studies of nuclear policy whose conclusions differ from my own – such as those of Schelling (1976), for example – also qualify as world-order analyses[14].

II. Questioning the postulates of nonproliferation doctrine

One line of attack on nonproliferation doctrine emerges from the bosom of the nuclear industry itself. Writing in *Fortune*, Tom Alexander (1975) declares that 'it seems clear that we are sacrificing too much of our foreign policy on the altar of nonproliferation.' In effect, Alexander is indicting US foreign policy, not only because it is futile so far as nonproliferation is concerned, but also because it is self-defeating as well – merely shifting important shares of the export market to foreign competitors who have less concern for nonproliferation goals than we. It also saturates the export market with more proliferation-prone technology (e.g. Canada's CANDU reactor, whose wastes are fissionable without reprocessing. Given the logic of the competition, on the one hand, and the priority of security, on the other,

[13]The range of approaches is indicated in Mendlovitz (Ed.) (1975).

[14]See also the study, *Nuclear Energy and National Security* (1976) for Committee on Economic Development, New York, of which Schelling was the Project Director.

American policy regarding international nuclear transactions is indeed implausible in a sense. Why shouldn't French or German competitors strive for a larger share of a lucrative market estimated to be worth $295 billion over the period 1971–1985? (Baker, 1975). Why shouldn't Brazil or South Africa acquire a nuclear option to satisfy the drive for a first-rank power status or as a hedge against future contingencies? Whether the issue be whales or nuclear bombs, all governments are primarily motivated by relatively short-term calculations of national economic and political self-interest. Their willingness to sacrifice any portion of that self-interest out of deference to the world-community well-being is purely rhetorical, if, and to the extent that, it exists at all. On nuclear policy specifically, America's apparently greater concern with nonproliferation does not display a more evolved world-community consciousness, but rather reflects its geopolitical position as a global security manager. As Hedley Bull (1975) puts it, implicit in the superpowers' choice 'of proliferation as the danger to peace and security that must be curbed now – rather than, say, the danger inherent in the growth of their own weapons stockpiles – is the perception that curbs in this area will restrict others and not themselves.' It is hegemony which is jeopardized by proliferation, because the spread of nuclear weapons makes it harder for the superpowers to control the boundaries and predict the outcome of regional conflicts in which they themselves have some involvement. In other words, both geopolitical control and bipolar stability are distinctively superpower preoccupations. Hence, it is not surprising that the United States aspires to reconcile its geopolitical and commercial goals at the altar of non-proliferation.

At the same time, I also agree with Richard Betts (1977) that 'the full cost of preventing a country from going nuclear has to be weighed against contradictory goals. Senator Ribicoff to the contrary, strategy has to accommodate to the fact that the United States has other interests in foreign policy besides prevention of nuclear spread.' One can add, of course, that so have other nuclear powers. These interests include export markets, political influence, regional balance, and great-power rivalry. There is simply no painless way for any of the nuclear supplier-states to implement a strategy of nonproliferation, and even American policy-makers don't necessarily agree among themselves that nonproliferation deserves absolute priority over all other foreign policy goals. For instance, if key countries like Iran, Saudi Arabia, or Turkey credibly threatened to shift their geopolitical allegiance away from the West unless they were allowed to achieve nuclear military status, American leaders would probably cease to insist on non-proliferation in strategically sensitive cases.

Nevertheless, if the nuclear suppliers can reach an agreement on common-ground rules, then both the superpowers will be able to pursue their global

geopolitical strategies without losing ground in the lucrative commercial market. Although the Soviet Union is more exclusively concerned with geopolitics than the United States, both countries seem to be moving toward a similar set of policies on nuclear issues (as was evident at the NPT review conference), and have even supported and taken part in the London supplier conferences. A common superpower position on nonproliferation seems to be emerging without any explicit concert of action.

An additional factor sets the nuclear superpowers apart from other supplier nations. The United States and the Soviet Union are both concerned with maintaining 'first use options' in situations other than the ultimate self-defense of homeland. Consequently, nonproliferation goals provide a convenient means of protecting existing military advantages for the present owners of nuclear weapons. For example, by threatening to defend South Korea with nuclear weapons during the Kissinger era, American officials sought a cheap option (compared to that pursued in Vietnam) of intimidating a non-nuclear Third World country with the specter of nuclear devastation.

Of course, such diplomacy itself undermines efforts to curtail proliferation, by demonstrating how vulnerable non-nuclear states are to such one-sided blackmail. Precisely because such a menacing posture brings the inherent discrimination of the NPT system into the open, it is criticized by moderate arms controllers. Generally 'liberals' and 'rationalists' understand that it could be costly to undermine the calculus of gains and losses associated with non-nuclear status[15]. However, the liberal critique is directed only to the excess of discrimination, not to its *existence*, nor to its underlying structure.

According to a less sentimental perspective on proliferation policy, the discrimination issue is only a red herring, an illustration of 'the moralist fallacy' which alleges that moral considerations have an important influence on behavior (in this instance, decisions to acquire nuclear capabilities), when the evidence seems to favor other explanations (namely, self-interest as related to fear and ambition). One analyst of this persuasion (Betts, 1977) contends that 'Stressing the discriminatory immorality of Soviet and American maintenance of large nuclear arms capabilities is analytically wrong, prescriptively quixotic, and a dangerous misdirection of effort.' Although its tone is strident, the statement does contain a grain of truth. Liberal attempts to blunt such 'discriminatory immorality' do tend to underestimate the logic of self-interested behavior, which is, after all, the dominant feature of the statist system of world order.

At the same time, I strongly applaud all efforts to stress discrimination

[15]See criticisms by the Aspen group of 'loose talk' by James Schlesinger (as Secretary of Defense) with respect to possible uses of nuclear weapons by the United States. As Michael Nacht puts the views of the conference participants, (in note 1 on page 15 of the Report), 'the right person to speak on questions of nuclear weapon use is the President and the tone should be one of awe.'

within the existing international order, if such efforts form part of an overall assault on the primacy of state interests and the war-based security system, on the hierarchical and hegemonical features of the state system, and on statist logic altogether. If our perspective is one of system-change rather than system-reform, then the acknowledged discrimination of nuclear-weapons distribution within the present system is both a mobilizing focus and a primary target. This emphasis is especially appropriate if our primary audiences are not policy-making elites, but more flexible and open-minded sectors of public opinion.

Even in the terms of statist logic, a geopolitical strategy that goes no farther than nonproliferation is questionable on both pragmatic and principled grounds. On pragmatic grounds, it is unlikely to work because there is no basic reason why those who want nuclear weapons should forego them, so long as some states insist upon their right to retain and develop weapons further. Moreover, so long as civilian nuclear power continues to expand, there can be no reliable assurance that any given state has not acquired a covert or latent nuclear-weapons capability. From a statist perspective, the most effective approach to nonproliferation would probably require a maximum extension of superpower roles. However, that outcome would itself conflict with the geopolitical goals held by the most intense advocates of nonproliferation. As Betts (1977) argues, 'There is no free lunch in nonproliferation policy . . . the biggest price would be the reaffirmation or extension of protective alliances which would relieve the insecurities' of those states tempted by their national situation to acquire nuclear weapons. Betts specifies this price tag in suggestive ways. It is worth stationing American troops on Israeli soil to obtain Israeli adherence to the NPT, he argues; it is also worth acquiescing in South Korean repression; worth incurring India's displeasure by aiding Pakistan in non-nuclear respects; worth letting China choose whether it wants the US to guarantee Taiwan against invasion or would rather risk having a nuclear Taiwan; and worth abandoning South Africa with the warning that the US will support the armed struggle of black Africans if Pretoria ever threatens its adversaries with nuclear attack (Betts, 1977). What is evident, whether or not one goes along with these policy prescriptions, is that there is no way within the state system to reconcile nonproliferation goals with other widely endorsed world-order values such as nonintervention, human rights, and peace. It is self-deceiving to claim otherwise.

On principled grounds, the morality of the state system is built around the primacy of state interests as conceived by governmental leaders. It is instructive to recall how enthusiastic our highest officials became upon being told in July 1945 that the atomic bomb would soon be definitely available to the United States as a weapon of war (against Japan)

and as an instrument of diplomacy (against the Soviet Union, and to a far lesser extent, Great Britain)[6].

True, once the horrible effects of atomic power became clear, there was some attempt (whose seriousness and reasonableness still are difficult to assess) to rid the world of nuclear weapons for all time. Nevertheless, the main patterns of behavior suggest that the use, development, and role of nuclear arms have been almost entirely determined by considerations of state power. Hence, there is little reason to suppose that such considerations will not prevail in the future, as they have in the past, in determining whether additional governments will decide to develop, deploy, and use nuclear arms. Government leaders may pursue self-destructive policies based on the narrow interests of their ruling groups and may, further, be entrapped within horizons of time and security which are far too short even from the perspective of national well-being. Nevertheless, such leaders are the only effective policy-makers on nuclear matters, given the structure and political realities of the state system. Furthermore, in a world system that has been victimized by imperial patterns of exploitation, there is little rational and even less emotional appeal in positions which are premised upon inherent discrimination between states which do and do not possess nuclear weapons at a given moment of time. The identity of 'responsible states' and 'terroristic elements' may seem crystal clear to George Ball and Henry Kissinger, but not at all so to the leaders of a wide variety of Third World nations, wherein more than two-thirds of humanity reside. Hence, a major conclusion of a world-order analysis guided by the values already enumerated is that nonproliferation goals can become persuasive ingredients of global policy only when they are integrated into a credible program of total denuclearization.

III. Toward military denuclearization

Military denuclearization means the process of progressively eliminating nuclear weapons. The goal is a non-nuclear world in which nuclear weapons are neither legitimate, nor possessed by any state. In the context of denuclearization, nonproliferation is obviously an integral but secondary

[6]The news of the successful test explosion at Alamogordo came to American leaders as they were attending the Potsdam Conference on the settlement of World War II, along with Soviet and British heads of state. Churchill observed that the news cheered up Truman to such an extent that 'He was a changed man'. One interpreter of the period reports that 'the reassuring news about the bomb wrought a complete reversal of US goals for the conference' (Yergin, 1977b)...

goal. From this perspective, the gravest dangers are presented, not by those international actors who *may* acquire nuclear weapons, but by those who already possess them, who rely on their active role in a variety of security situations, and who have continued to deploy and 'improve' upon nuclear weapon systems[17].

In world order terms, the argument for denuclearization is again both pragmatic and principled. From a pragmatic perspective, denuclearization is the only way to overcome the inherent discrimination of the present world-order system and, in particular, the most extreme manifestation of that discrimination – namely, the capacity of nuclear states to decisively affect the security of non-nuclear and lesser nuclear states, under a wide variety of circumstances. Moreover, the state system derives its moral legitimacy from the juridical premise of sovereign equality. From a principled perspective, then, denuclearization would constitute a fuller realization of statist logic, which would in turn provide a positive basis for moving beyond the state system at some future time. Hence, whether the ultimate goal is to *reform* the state system or to actually *transform* that system, denuclearization would have a decisively beneficial effect. Nonproliferation divorced from denuclearization, by contrast, is at best ambiguous from both perspectives: it could possibly make the system more stable, but might well stabilize it in an imperial fashion.

Assuming, then, that denuclearization is a positive goal, is it also a feasible one? If so, to what extent? Even those who favor the approach disagree among themselves here. If denuclearization is to gain any momentum, far-reaching changes in the political climate must first take place within the leading nuclear nations. The prospects of denuclearization, at least in the decade ahead, will depend largely on domestic politics, and partly upon the interactive behavior and perceptions of the two superpowers. So long as the goal of genuine denuclearization lies outside the mainstream political debate in the United States and the Soviet Union, it has virtually no hope of getting started, at least this side of nuclear catastrophe.

Does the present atmosphere permit at least *modest* steps toward denuclearization? Unfortunately, even limited efforts in this direction are

[17] The R & D and innovations pursued especially by the superpowers have been undertaken in a competitive pursuit of 'superiority' rather than to assure the stability of deterrence. In other words, one cannot even argue convincingly that existing nuclear powers behave 'responsibly' within the framework of stable deterrence. In the current context of international relations, the nuclear arms race – with only its few mutually agreed upon 'constraints' such as arms control measures – seems every bit as 'irresponsible' as the acquisition of nuclear weapons by additional governments. In essence, there is no particular reason to believe that today's nuclear powers are any more reliable than future nuclear states (in the Third World or elsewhere) would be. The evidence suggests that virtually *all* states are highly irresponsible, when it comes to issues of national security.

more problematical than is generally supposed. So long as the statist logic persists, government bureaucracies will be inherently incapable of endorsing policies which reject the endless search for military advantage. Hence, small steps like signing the ABM treaty or cancelling the B-1 program seem positive only when viewed in isolation, but not if evaluated in their full bureaucratic contexts. In such cases, as we have seen, alternative weapons systems at least as lethal are accelerated – 'to fill the vacuum'. This process is especially misleading to the general public. Encouraged to focus on dramatic and well-publicized concessions to 'peace', most citizens can hardly help overlooking the technical diversion of funds to other weapons programs. Significantly, when President Carter vetoed the B-1 bomber, his explanation did not seem influenced at all by world-order goals[18]. Only a visionary leader willing to mobilize populist support could circumvent powerful special interests and the structures of bureaucratic politics. And then it is not evident whether such a leader could survive, physically or politically. Existing political elites seem genuinely entrapped, and cannot provide credible leadership to achieve even modest world-order goals.

Despite these caveats, several promising steps toward denuclearization could be taken right now. For instance, top government officials can and should repudiate the loose talk about using nuclear weapons in Third World contexts or against non-nuclear weapons states. Perhaps the main nuclear powers could even pledge never to use nuclear weapons first against a signatory of the NPT, or against non-nuclear powers. Such pledges might be reinforced and given credibility by shifting patterns of nuclear deployment (for example, nuclear weapons could be removed from Korea and from forward positions in Western Europe). However, such denuclearization steps, desirable as they are, might also be viewed as nothing more than attempts to restore the prospects of nonproliferation. In this respect, such forms of denuclearization are of a piece with various proposals designed to extend the so-called 'nuclear shield' to non-nuclear states, or to work out contractual arrangements for peaceful nuclear explosions[19]. With all such proposals, nonproliferation is the essential goal and modest denuclearization is viewed – usually implicitly – as a tactic, virtually as 'a bargaining chip'.

In some instances, admittedly, denuclearization and nonproliferation appear to work at cross purposes. For example, in 1977 South Korea's President Park Chung Hee declared that his country would acquire its own nuclear arsenal, if the US followed through President Carter's plan to remove

[18]As Bernard Weinraub, Pentagon correspondent for the *N.Y. Times*, concludes: '. . . it is evident that Mr. Carter's impulses were based by and large on military considerations'. See Weinraub's persuasive analysis of B-1 decision in *New York Times*, July 3, 1977.

[19]I have in view the various proposals and incentives to forego nuclear weapons contained in articles by Bloomfield (1975) and Frye (1976) in this light.

nuclear weapons and American troops from South Korean territory[20]. How seriously should such a threat be taken[21]? Suppose South Korea does develop nuclear weapons in the wake of American withdrawal? Is the process of denuclearization worth the dangers of short-term proliferation? In another context, advocates of the neutron bomb (the so-called 'enhanced radiation weapon') contend that its deployment in Europe will enhance NATO's credibility and make the outbreak of nuclear war less likely (Wienraub, 1977). In the short run, the logic of strategic thinking cuts deeply into arguments for denuclearization.

A comprehensive test ban (CBT) would represent a more momentous step down the denuclearization path, because it could substantially inhibit further nuclear weapons innovations–provided, of course, that it was imposed before accuracy, reliability, and throw-weight goals had been already attained. Here again, CBT is generally viewed as an element of reciprocity required to make nonproliferation credible in a world of self-assertive states. However, its implications could be more systemic–especially if linked to shared commitments by Moscow and Washington, first, to renounce limited nuclear war options, and, second, to limit the role of nuclear weapons to mutal deterrence of nuclear aggression.

A comprehensive no-first-use pledge would be another constructive step. Such a declaratory measure could provide important symbolic acknowledgement that nuclear weapons are illegitimate weapons of war, much as poison gas or biological weapons. To be credible, a no-first-use pledge would have to be coordinated with programs to redeploy nuclear weapons away from frontiers, and to augment conventional capacities, thereby signaling specific second-use intentions for nuclear weapons. Such a no-first-use declaration, if solemnly made and implemented, would have immense value as an educational experience that would, in turn, seem to support more drastic forms of denuclearization. Ironically, in the present world setting, it is not the superpowers but the pariah states vulnerable to armed attack who may prove the most reluctant to make such declarations. These pariah states are the only ones who face a severe security threat, but who do not seem capable

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[20]President Park Chung Hee has warned of this consequence of US troop withdrawals (Halloran, 1976); Evans and Novak (1976).

[21]Of course, the tendency toward self-nullifying actions should not be ignored. After President Carter declared that he was planning to remove nuclear weapons from South Korean soil, he reaffirmed their possible use by air or sea launch in the event of a Korean War (*New York Times*, May 30, 1977, p. 2). The result is the worst of both worlds: nuclear deterrence in Third World contexts is perpetuated, and South Korea is induced to acquire nuclear weapons of its own. In cases like this, liberal statists do more to subvert stability in the present world order system than do their more conservative counterparts. The most recent reports suggest that the Carter Administration may not, after all, remove nuclear weapons from Korea, or do so slowly and tentatively over a period of 4–5 years (Beecher, 1977).

of evolving any substitute for nuclear weapons[22]. Nevertheless, even if pariah states should remain outside the no-first-use orbit, the step would be a promising one, as it touches upon the geopolitical nexus of the existing system.

If we are to move beyond these secondary declaratory steps, however, the continental divide which separates nonproliferation thinking from denuclearization thinking must sooner or later be crossed[23]. Up to this point, the two perspectives overlap and conflicting interpretations are plausible for any given step. As suggested already, unambiguous denuclearization presupposes a domestic political shift of values and priorities within the principal nuclear states. It is difficult to depict the precise character of this value shift, but it would almost certainly have to involve a societal commitment to the pursuit of drastic global change, based on the sort of world-order values outlined above[24]. This shift need not entail a commitment to world government nor to any other specific structure. In fact, I personally favor world-order solutions based on political and economic decentralization combined with functional centralization.

A value shift would finally clear the path for genuine nuclear disarmament, to be accompanied at later stages by conventional disarmament as well (beginning with high-technology weapons like precision-guided munitions). Nevertheless, even after genuine nuclear disarmament becomes an accepted goal, the traditional bureaucratic consensus is likely to make sure that each step toward denuclearization and disarmament is followed–and perhaps even more than offset–by compensatory moves which augment conventional weapons both quantitatively and qualitatively. In other words, even if the denuclearization divide has been clearly crossed, the disarmament divide will still remain. In time, the value shift needed to cross the first may also generate sufficient momentum to carry the political process across the second as well. However, this optimistic possibility is by no means assured. So long as

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[22]It is possible to imagine security guarantees that would substitute for the residual threat to use nuclear weapons. Such guarantees have been proposed in the United States on behalf of Israel. However, to guarantee the security of a pariah state means trying to freeze a status quo which seems unacceptable to most of the world. The very offer of a guarantee entails high social costs, and its controversial character probably makes the guarantee itself unreliable. The pariah state, sensing this unreliability, would still, I suspect, be hesitant to renounce an ultimate nuclear option even if it received a strong guarantee of its present borders. Similarly, in such contexts political compromises may not appear available to the parties, and hence there would be no alternative to armed struggle. In such a conflict, the parties will not often be prepared to renounce any weapon or tactic that might prove useful under some set of circumstances. But in such a case official renunciation would not seem reliable any way.

[23]For a world-order analysis of the Vladivostok Accord, see Johansen (1976).

[24]For one concept of a transition process that aims to achieve total nuclear disarmament, see Falk (1975).

policy-making elites in powerful states adhere to conventional notions of national security, the outlook for disarmament is bleak indeed[25].

During the transitional periods when each of these major divides are being traversed – from nonproliferation to denuclearization and finally to general disarmament – political leaders are bound to feel that their national security is being eroded. Coping with these fears and with the counterproductive behavior they may incite will present critical challenges to advocates of drastic global change. The problem can hardly be solved until new concepts of national security and positive visions of comprehensive change find their way into the ruling circles of the major powers.

When the governments of the world at last begin to lay down their nuclear arms and then their conventional weapons as well, it will probably be useful to establish a supranational police/military capability to serve on both regional and global levels. An institution of this kind could help enforce the disarming process, and could also play a transitional role as supranational 'manager' for maintaining global peace[26]. To prevent new incarnations of the war system from emerging, an appropriate constitutional framework will also be needed, with particular emphasis on checks and balances, separation of powers, compromises between efficiency and accountability, and, most of all, a new image of national security that does not depend on military might[27]. Deep in such a disarming process lies the question of whether a supranational security agency should itself possess nuclear weapons as a residual deterrent against cheating, nuclear rearmament, terrorism, and the like. If and when the time comes, this will be an extremely vexing issue, but it is not one which can be predetermined in the present global setting. (Even should a supranational security agency be armed with nuclear weapons, presumably that decision would be a conditional and temporary one hedged by elaborate constraints.)

IV. Is military denuclearization enough? A case for civilian denuclearization

The history of civilian nuclear power is a twisted one. It is closely associated with the sense of guilt felt by those who first developed the atomic bomb, and who subsequently tried to make partial atonement by putting the atom to

[25]For a persuasive depiction of institutional barriers to disarmament on the national level, see Barnet (1972).

[26]One proposal along these lines may be found in the WOMP II paper of Robert Johansen and Saul H. Mendlovitz, 'Global Enforcement of Just Law: A Transnational Police Force'.

[27]For some creative research and analysis along these lines, see Roberts (1976).

constructive use. Their hope was that the civilian nuclear spin-offs, once perfected, could be lifted from their military context, put to good domestic use, and then transferred abroad through the Non-Proliferation Treaty – which would yield lucrative foreign markets for US industry in the process. However, the hope that atomic power could serve peace without being tarnished by the horror of Hiroshima fostered an artificial separation between the military and civilian nuclear programs. The catch, and it is a catch 22, is that there is no way to spread nuclear technology around without inevitably spreading the weapons capability right along with it[28]. It took India's nuclear explosion to bring this reality home. Until then, nations with civilian nuclear programs were indiscriminately put in the category of non-nuclear states, for military and international-legal purposes, unless they had actually tested a nuclear bomb. This view reinforced the illusion that only military proliferation as such was evil, but that civilian nuclear spread was beneficial (or at least neutral) from the perspective of international stability.

In recent years, however, far more sophisticated measures of nuclear capability have emerged. They include the possession of basic nuclear knowledge, the number and kind of fuel-cycle facilities, access to fissionable material, the extent of technological engineering and managerial know-how, and so forth (Dunn and Overhold, 1976). More generally speaking, the link between civilian nuclear proliferation and the proliferation of nuclear weapons has now passed into conventional wisdom.

Three major strategies have evolved in response to this new insight, but all with only the limited goal of halting the spread of nuclear arms. In other words, the principal lines of thought all represent extensions of the non-proliferation approach to international security. The first such strategy involves a moratorium or even an outright ban on commercial nuclear power. In part, this approach is an offshoot of the general Western anxiety about nuclear weapons falling into 'wrong' hands (Yergin, 1977a). Responding to 'the terrifying prospect of atomic bombs almost everywhere', Daniel Yergin cites the abandonment of civil nuclear power as possibly 'the decisive step' in the struggle against proliferation. In view of his overall assessment of nuclear power, including its declining commercial appeal, Yergin calls for an American moratorium on 'the new development of conventional fission nuclear power'[29]. In several major countries there is already growing support for this approach[30], motivated largely by the belief that civilian nuclear

[28]For documentation, see Wohlsletter (1976–1977).

[29]The most effective discussion of these issues is to be found in Theodore B. Taylor and Mason Willrich (1974).

[30]See Sweet (1977); see also the international opposition to nuclear power in Hayes (1976). See also Lovins (1977), who portrays the situation as follows: 'Nuclear opposition is all but halted

power facilities simply cannot be safeguarded well enough to permanently deter or foil nuclear theft. Lovins, an antinuclear spokesman, explains: 'The fundamental reason that nuclear theft cannot be prevented is that people and human institutions are imperfect. No arrangement, however good it looks on paper, and however competently and devotedly it is established, is proof against boredom, laxity, or corruption.'

Those who adhere to an opposing line of thought insist that it is misleading to lump all civilian nuclear technologies together. They point out that there are, in fact, several distinct variants already in being and even more are in the offing. Therefore, this approach to nonproliferation is to discourage the most proliferation-prone technologies (those having to do with breeder reactors and plutonium recycle), and to encourage those that are most resistant to use for weapons production[31]. This camp has always found fusion technology especially attractive, since it produces no weapons-grade material as a byproduct, and the attendant problems of accident, radioactive hazard, and waste disposal seem smaller than in the case of fission. However, certain serious environmental and security problems do exist. Moreover, fusion reactors require astronomical capital outlays that would centralize energy production to an even greater degree than a large-scale fission program. It has been estimated that $20 billion would be needed in the research and development phase 'before commercial use could be contemplated'[32]. Moreover, the technical obstacles to commercial nuclear fusion remain so formidable that they may well prove impossible to overcome. At best, it seems implausible to expect fusion technology to be available until well into the next century, if at all (Kenward, 1976; Lovins, 1975; Miller, Jr., 1975). Finally, the most probable line of fusion development would embody the worst features of breeder technology, including its susceptibility to proliferation. For technical and economic reasons, 'the first generation of fusion reactors would consist of fusion-fission hybrids designed to breed plutonium' (Hayes, 1976). Hence, all things considered, nuclear fusion appears to be an impossibly difficult or at best an exceedingly long-term and

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by grass roots opposition in Japan and the Netherlands; has been severely impeded in West Germany, France, Switzerland, Italy, and Austria; has been slowed and may soon be stopped in Sweden; has been rejected in Norway and (so far) Australia and New Zealand, as well as in several Canadian provinces; faces an uncertain prospect in Denmark and many American states; has been widely questioned in Britain, Canada and the USSR; and has been opposed in Spain, Brazil, India, Thailand, and elsewhere.'

[31] In this regard, see Feiveson and Taylor (1977), expecially the discussion of the thorium option (generating power by using thorium as the basic fuel), which the authors allege is easier to safeguard against diversion than fission technology. But see Lovins (1977) for the contrary view that the thorium cycle uses a mixed oxide from which plutonium can easily be extracted.

[32] *Nuclear Power Issues and Choices*, Report of the Nuclear Energy Policy Study Group, The Ford Foundation, Cambridge, Mass., 1977, p. 147.

costly energy option which, in all probability, would not even achieve the goal of curbing weapons proliferation.

Up to now, the United States has been pursuing a third strategy: attempting to strike a compromise between nonproliferation objectives, and economic/energy goals. This official approach centers on internationalizing those elements of the fuel cycle most susceptible to illicit diversion[33]. Its essence, however, is to regard inherent discrimination as a permanent feature of international relations, and to assume that the global spread of civilian nuclear power facilities is inevitable and irreversible. For this reason, the prevailing goals, as expressed in nonproliferation terms, are to bring the pace of nuclear spread into line with 'realistic' expectations. The most we can hope for, in this view, is to avoid the emergence of 20 to 50 nuclear powers by the year 2000, and to prevent illicit acquisition altogether. For example, the Aspen group's positive image is a world with no more than ten nuclear powers by 2020; George Quester (1975) suggests that one more nuclear power each decade would be acceptable.

Perhaps the most notable aspect of the twin debates over civilian nuclear spread and over nuclear proliferation in the military realm is their relative isolation from one another. So far, domestic discussions of nuclear power have largely ignored international security questions, focusing instead on matters of safety, health, environmental quality, political centralization, and civil liberties (Falk, 1976 and Hayes, 1976). Failure to link these two sets of issues seems foolishly shortsighted, because both the capital requirements and the lead times needed to readjust energy systems make civilian nuclear power a world-order issue of first magnitude. To be more specific, the heavy investments demanded by a large-scale nuclear energy program would set critical – even though not yet generally evident – limits on the prospects for realizing world-order values.

This paper, however, limits itself to exploring whether meaningful and permanent denuclearization can be achieved in the military sphere as long as governments continue to pursue the civilian nuclear energy option. In other words, if we are to rid the world of atomic weapons forever, must we repudiate the 'peaceful atom' as well? The answer seems clear, given the impact of a global civilian nuclear power program. First of all, the rapid spread of reactors (SIPRI estimates a fourfold growth from 99 reactors in 15 countries in 1970 to 405 reactors in 28 countries by 1980) in the years ahead

[33]See Baker (1975); see also Bloomfield (1975), who says: 'Our puzzle is how to change the system enough to get a better political-psychological base under nonproliferation without having to work a total transformation in man or in the basic geometry of his political world.' This basic geometry appears to include the retention, and even the continuing development, of nuclear weapons by the existing nuclear powers. See also a list of proposed steps to undergird NPT system in Nacht (1975); see also Wohlsletter (1976–1977).

vastly increases the global potential for weapons proliferation[34]. If that potential should be rapidly translated into weaspons capability, then the movement toward denuclearization is likely to be thwarted and perhaps irreversibly so. The mere attempt to discourage the surreptitious manufacture of nuclear weapons would require significant degrees of surveillance and intrusive inspection, as well as changes in export policies of all nuclear suppliers. Surely, the prospects for denuclearization, already doubtful in a world of persisting inequality and conflict, would be even more vulnerable to disruption at an increasing number of points in a world of ubiquitous nuclear power plants. Clearly, there is something incoherent about trying to get rid of nuclear weapons while simultaneously disseminating the techniques and materials that make their acquisition ever easier[35]. More important still, the prospects for denuclearization presuppose broad social movements within many societies, around a series of interrelated value goals. These goals include some loosening of centralized political controls over national populations, but that possibility is virtually precluded by civilian nuclear power – with its terrorist potential, its high degree of energy centralization and its concomitant need for equally centralized political control.

All nuclear facilities, whether civilian or military, must be vigilantly guarded. Recent studies in the United States and elsewhere emphasize the vulnerability of these facilities, especially in view of the inadequacy of present security standards, (Lovins, 1977). Better protection, extending to lines of supply, shipments of nuclear fuel and, possibly, spent fuel and wastes requires a virtual paramilitary capability with extensive authority to handle suspects and threats. Democratic procedures and associated civil and political rights are too fragile to withstand such intense security pressures (Ayres, 1975). Given a world-order perspective that emphasizes the interrelations of values, it is important to assess energy and security policy choices with reference to their impacts on prospects for humane governance. On this basis alone, nuclear power appears unacceptable.

Symbolically and psychologically, the movement against nuclear power must be comprehensive, encompassing its military and civilian dimensions alike, if it is to achieve real mobilizing power. Lovins (1975) puts this well in arguing that the combination of elements in the overall denuclearization process produces 'a psychological synergism that is essential to their success'.

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[34]See *The Nuclear Age*, 1974, Stockholm International Peace Research Institute, Cambridge, Mass., MIT Press, p. 45.

[35]As Wohlsletter (1976–1977) notes, a non-nuclear recipient of nuclear technology can come to the very verge of weapons capability without violating any legal obligations under the NPT. He illustrates this with the startling assertion that a nonweapon state can come closer to a plutonium weapon today than was the United States in 1947 when the assembly of bombs required many hours for fusing and wiring components together.

In effect, the linkage between nuclear weapons and nuclear power produces mutually reinforcing patterns of support, as the coherent possibility of life-affirming alternative approaches to security and energy become more credible. A comprehensive antinuclear movement draws upon the vital energies of peoples devoted to keeping the earth safe and secure for future generations. To repudiate nuclear technology in all its forms would be to withdraw from a nuclear bargain that should never have been struck in the first place. The human species is not so constituted that it can achieve the infallibility and societal performance that nuclear safety presupposes, just as it isn't able to achieve the perfect rationality presupposed by deterrence-based security programs.

Is it feasible to eliminate commercial nuclear power from the world scene? Current trends certainly lead in the opposite direction, and to reverse them would require at least momentous decisions by the United States and other advanced industrial countries. In the short run, while alternative energy sources and decentralized social systems are being developed and deployed, some oil-dependent, balance-of-payment deficit countries may feel that they are locked into the nuclear option. However, recent research shows that even nations as dependent on imported energy as Japan could actually become energy independent, through a combination of rigorous conservation measures and the use of renewable, decentralized fuels (Lovins, 1976).

In view of the costs and dangers of nuclear energy, soft-energy alternatives, whose viability has been sufficiently demonstrated, deserve serious commitment. Even the prestigious Ford Foundation study of 1977 concludes, despite its acceptance of the inevitability of nuclear power, that 'there is enough solar energy to meet any foreseeable needs for electrical energy. The question is one of price.' Essentially because of this 'question of price', the study concludes that solar energy 'may provide a significant fraction of energy in the United States, but not until rather far into the twenty-first century, and with a price premium over nuclear or coal power.[36]' Other assessments of solar potential are far more encouraging in respect of both time and cost. For instance, Feiveson and Taylor (1977) contend that 'the prospects are excellent that solar energy can be developed and implemented

[36] The text goes on to argue that 'the capital cost per kilowatt of peak capacity for most methods of converting solar energy to electricity in central-station facilities is estimated to be more than double that of nuclear power, a figure that must be multiplied by another factor for additional costs of energy storage' (p. 137). This cost assessment seems unduly pessimistic; it presupposes a continuing need for centralized electrical energy systems, and overlooks important cost savings (most obviously, of course, on fuel supplies and pollution control). On the availability of solar energy, the figures thrown up in the study are reassuring: 'The amount of solar energy falling on the United States is enormous: 44 000 quads per year. The present annual U.S. consumption of electrical energy could be supplied by 0·15 per cent of this solar energy, if it could be used at 10 per cent efficiency.'

on a large scale in a period of time comparable to that required to develop fully-safeguarded breeder systems[37].' Even a government-sponsored study of solar energy, which shares the conventional wisdom about high energy requirements, concludes that 'Solar energy is not a cure-all for our energy problems; but combined with a larger strategy that includes energy conservation, cascading, and some sacrifice of convenience, solar energy does offer the option of a society based upon a renewable source of energy[38].'

In a sense, these assessments of solar potential are only minimal statements, based on technical and economic considerations. More positive and ambitious scenarios for the energy future of the world are now being projected. Writes Denis Hayes (1977a).

> About one-fifth of all energy used around the world comes from solar resources: wind power, water power, biomass, and direct sunlight. By the year 2000, such renewable energy sources could provide 40 per cent of the global energy budget; by 2025, humanity could obtain 75 per cent of its energy from solar sources. Such a transition would not be cheap or easy, but its benefits would far outweigh the costs and difficulties.

During the period of transition, coal and conservation techniques (in building codes, automobile designs, and many industrial processes) could play an enormously constructive role in assisting us to move from our current reliance on finite reserves of oil and natural gas, to renewable energy sources. Lovins (1975) envisions an 'energy income economy by 2025' (that is, one based on renewable resources) and argues that this goal can be implemented without great strain if 'the sophisticated use of coal, chiefly at the modest scale' is encouraged to relieve the pressure on oil and gas during the transition period. Full-scale arguments on the viability of renewable fuels and possible transition strategies are enormously complex, of course, and are not all equally convincing. Nevertheless, authors like Hayes and Lovins have effectively shifted the balance of persuasion to those who persist in their belief that nuclear power is necessary and/or inevitable.

The changing economic realities pertaining to nuclear power, too, make

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[37] After considering the sort of economic obstacles which the Ford study finds decisive in the intermediate period, Feiveson and Taylor (1977) conclude, 'We are more optimistic about solar energy than most people and are encouraged by the increasing rate at which promising new concepts are being proposed and assessed. The biggest uncertainty about solar energy, in our minds, is how long it will take to implement its use on a large scale. However, it is not at all clear that this time will be significantly longer than the time required to develop worldwide fission breeder reactor systems that are effectively safeguarded against diversion of nuclear materials to destructive purposes.'

Note, also, that breeder technology is a virtually inevitable sequel if we opt to rely on fission power, because uranium is expected to run out by the end of the century. Of course, even if the US doesn't resort to breeders, plutonium will be present in large quantities by the early 1980s in many other countries.

[38] *Solar Energy in America's Future – A Preliminary Assessment*, Stanford Research Institute, Report for US Energy and Research Development Administration, January 1977, p. XVII.

its elimination more feasible than is generally supposed. The original case for peaceful nuclear power was based on the extravagant claim that it would be 'too cheap to meter'. But recent trends reveal a steadily increasing price per nuclear kilowatt hour, as well as a deteriorating cost picture relative to other energy sources. A careful analysis of US fuel costs shows that in all regions of the country, coal is now cheaper than nuclear power, although the degree varies from 2% less in the northeast, to 49% in the Mountain Pacific northwest region[39]. Although nuclear power is often justified on economic grounds by those who believe we cannot afford to forego its cost advantages while basic needs go unmet around the world, the reality of rising nuclear costs undermines the validity of such economic rationale for proceeding down the nuclear path.

It is necessary to consider briefly the impact of these proposals on the economic prospects for poor Third World countries. Of course, the renewable energy potential of a given country varies according to geographical location, wind and geothermal resources, and hydroelectric potential. On the whole, however, Hayes (1977b) maintains that 'In the Third World, enormous strides can be made with relatively modest investment if those investments are made wisely. For example, 2 per cent of the world military budget for just one year could provide every rural Third World family with an efficient stove – doubling overnight the amount of useful work obtained from fuel wood, and reducing the pressure on the world's forests accordingly. On the other hand, to the extent that Third World development is culturally or economically tied to energy strategies in the industrial world, the pressure to import nuclear technology will remain strong. At one stage, renewable energy systems were viewed as 'second-rate' solutions that no self-respecting Third World country would adopt. More recently, however, especially in the wake of the OPEC experience of 1973–74, Third World countries have shown a great deal more interest in evolving indigenous capabilities for energy production. As Hayes notes, these 'indigenous technologies born of the new capability may prove to be more compatible with world needs than borrowed machines and methods.' He goes on to point out that 'Brazil's large methanol program, India's gobar gas plants, and the Middle East's growing fascination with solar electric technologies can all be read as signs of an interest in renewable energy resources that bodes well for the future.'

Furthermore, renewable energy systems tend to be far more labor-intensive and decentralized, thereby encouraging productive use of the labor

[39]Testimony by Charles Komanoff on the costs of nuclear power before the House Subcommittee on Environment, Energy and Natural Resources, September 21, 1977 (mimeographed); see table on relative costs of coal and nuclear power in different regions of the United States, p. 1.

surplus which characterizes most poor countries, and also disengaging the economies of these countries from their expensive dependence on imported energy, capital, and technology. In this regard, goals of equity and self-reliance associated with world-order values seem to be tangibly facilitated by soft energy options.

Finally, even double denuclearization – eliminating nuclear weapons and civilian nuclear power – will not be enough to assure the success of the wider program of global changes envisioned here. The process of getting the nuclear genie back in the bottle must be associated with and sustained by a social movement organized around the interrelated pursuit of peace, economic well-being, social and political justice and ecological balance, held together by an emergent sense of human community and planetary identity[40]. Such a movement need not be dedicated to global federalism. However, I personally hope that it would emphasize the deconcentration of wealth and the dispersal of authority at the national level. Presumably, some modes of central guidance will be required, but the preferable organizational dynamic would be dialectical, weighted toward the greatest possible decentralization of societal functions which still allows for the satisfaction of basic human needs. Separate state sovereignties, although still often useful to redress grievances within the existing frame of world politics, cannot be trusted to protect long-run human or overall planetary interests. I do not suggest that the state as actor will *disappear*, but that it will be *displaced* to varying degrees on various issues in varying places, by functional arrangements (international and transnational actors) which augment the roles of individuals, groups and international institutions. (It is important to stress the unevenness of this displacement process. For example, the state may play a diminishing role in advanced industrial countries, at the same time that it is augmenting its functions within many Third World countries.)

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[40]Amory Lovins advocates a three-part strategy for the United States: (1) abandoning nuclear power, (2) reallocating resources in the direction of making soft-energy paths based on solar, wind and geothermal energy courses viable at home and abroad, and (3) treating nonproliferation, control of civilian nuclear technology, and strategic arms reduction 'as interrelated parts of the same problem with intertwined solutions'. He maintains that these three steps provide 'a universal, nondiscriminatory package of policies' that 'would be politically irresistible to North and South, East and West alike'. This approach very closely parallels the argument of this paper, but with two significant differences. First, I believe that the total elimination of nuclear-weapons capabilities is essential to any process of strategic arms reduction. Secondly, I believe that denuclearization and energy policy must be related to the wider social and economic issues of global reform. Of course, there is a tactical advantage in presenting the smallest credible package in order to make the process of adjustment appear as manageable as possible. My own assessment, however, is that the package will not be credible unless it is enlarged in the ways I have indicated. Lovins's proposals are sufficiently integrated and bold to start us down the right path. Once firmly on this path, we may be able to widen it along the lines discussed above, but I am fearful of mounting a radical argument that is not convincing on its own terms.

V. Is drastic global reform too far out?

The influential Ford Foundation study structures its proposals and analysis on the basis of two explicit premises:

(1) 'Nuclear energy is now a fact of international life and will provide a significant portion of the world's electricity by the end of the century.'

(2) 'In our view, the most serious risk associated with nuclear power is the attendant increase in the number of countries that have access to technology, materials, and facilities leading to a nuclear weapons capability.... If widespread proliferation actually occurs, it will prove an extremely serious danger to U.S. security and to world peace and stability in general.'

These premises betoken a marginalist view of societal potential. Implicit throughout the study is the assumption that speculation concerning social policy must always be constrained by 'the given'. On the basis of this operating assumption, small adjustments alone merit serious consideration. Thus, nuclear-based security is taken for granted, as is the viability of commercial nuclear power. The policy recommendations which can be made within these confines include the deferral of nuclear reprocessing, a slowdown of research and development on breeder reactors, strengthening controls over the exports of enrichment technology, and, of course, an extensive program to improve safeguards and security capabilities against nuclear theft or terrorism.

The Ford study is bound to influence US policy-makers. It has the unanimous backing of prestigious and respected experts, and offers the hope that everything will be fine if only some minor adjustments are made. The report points out that these required adjustments may bruise some domestic interest groups while favoring others, but on balance the study's recommendations call for no major alterations in the nation's plans, values, assumptions, policies or outlook.

The advice the report gives may provide short-term reassurance, but, by underestimating the context of danger, it correspondingly constricts the arena of appropriate choice. Accepting the Ford study prescription would mean reinforcing the principal tendencies of the present world situation, including the pressure to nuclearize in both military and civilian domains. The need, on the contrary, is to arrest and reverse these trends in the only time still left – perhaps no more than a decade – to reorient security and energy policies in positive directions. At best, the Ford study is a prudent assessment of the short-term interests of the United States as prime world economic and security manager. In my judgment, this effort to shape conventional

wisdom on nuclear policy, however competent the analysis, is a gross example of unintentional mystification and misdirected energy. It does not help us understand what is needed, what is desirable, or what is possible. Conventional wisdom, such as that represented by the Ford study, despite its good intentions, encourages us to relax in the sinking vessel at precisely the moment when we should all be lowering the lifeboats.

Conventional wisdom often embodies what C. Wright Mills defined as 'crackpot realism'. The presumed permanence of inherent discrimination within the international political order, and civilian nuclear power as an irreversible fact of life are largely unexamined instances of contemporary 'crackpot realism'. Precisely because the deficiencies of modern civilization are so fundamental, the resistance to honest examination of these deficiencies is intense and emotional. One who adopts a skeptical view and projects an alternative vision of the future is dismissed as 'utopian' or 'romantic', another Don Quixote riding into battle to tilt at windmills. The condescension in establishment circles also derives, in part, from a materialist view of history which associates human progress with technological inevitability. Those who adhere to this worldview regard proponents of demilitarized, decentralized security and energy systems as reactionary, naive or peculiar dreamers who seek to 'go back' to something primitive. My argument is premised upon a different and, I believe, a more positive image of historical and cultural evolution. In my view, 'progress' evolves in a more elusive fashion, according to spiral forms, going back to earlier patterns but at a higher level, in a different setting, acting as a rediscovery that builds upon the insufficiencies of what preceded. In this view, the future is neither a projection of the past, nor a series of repetitions, but is rather a sequence of ascending spirals which exhibits a complex interplay of recurrence and innovation[41].

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[41] For a discussion of the spiral image as an alternative to linear thinking, see Jill Purce (1974). The same perspective underlies the work of Theodore Roszak (1975), although he does not specifically invoke the image of the spiral.

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